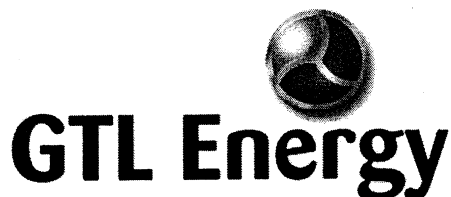


## Permit Application

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GTL Energy (USA) Limited  
6215 Cottonwood Shores Drive  
Wellington CO 80549-1674  
UNITED STATES OF AMERICA  
Telephone +11 970 568 0011  
Facsimile +11 970 568 0012  
Web [www.gtlenergy.com.au](http://www.gtlenergy.com.au)  
A subsidiary of GTL Energy Limited  
in Australia.

27 October 2008

Mr Craig Thorstenson  
Division of Air Quality  
North Dakota Department of Health  
918 E Divide Avenue, 2<sup>nd</sup> Floor  
Bismarck, ND 58501-1947

Dear Craig

**GTLE Dakota Plant 1 LLC (GTLE): Air Permit Application**

Please find attached our Air Permit Application for construction and operation of a coal beneficiation plant at 3942 125<sup>th</sup> Avenue SW, South Heart North Dakota.

The application contents are summarized as follows:

- AP100 – Air Contaminant Sources
- AP101 – Fuel Burning Equipment for Indirect Heating (Gas Fired Boiler)
- AP102 – Manufacturing and Processing Equipment
- AP109 Baghouse 1 – Gas Cleaning Equipment (Truck Dump)
- AP109 Baghouse 2 – Gas Cleaning Equipment (Raw Coal)
- AP109 Baghouse 3 – Gas Cleaning Equipment (Dryer)
- AP109 Baghouse 4 – Gas Cleaning Equipment (Product Coal)
- AP113 – Internal Combustion Engines (Emergency Generator)

Supporting these application documents are the following appendices:

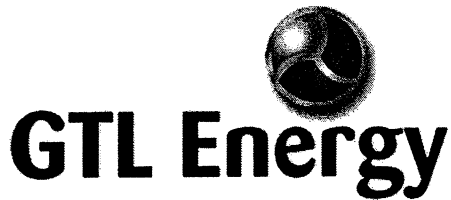
Attachment 1 – Taggart Global LLC Report dated 23 October 2008  
Attachment 2 – Plot Plan  
Attachment 3 – Site Map  
Attachment 4 – 3D Rendering of the Buildings  
Attachment 5 – General Arrangement Plan View of Buildings  
Attachment 6 – General Arrangement Section View of Buildings

Any questions please call John Shultz.

Kind Regards

Robert R French  
Chief Executive Officer - GTL Energy (USA) Limited

CC: John Shultz, GTL Energy  
David Bass, Taggart Global LLC Project Manager



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23 January 2009

Mr Craig Thorstenson  
Division of Air Quality  
North Dakota Department of Health  
918 E Divide Avenue, 2<sup>nd</sup> Floor  
Bismarck, ND 58501-1947

Dear Craig

**GTLE Dakota Plant 1 LLC (GTLE): Revised Air Permit Application**

Please find attached our revised and final Air Permit Application for construction and operation of a coal beneficiation plant at 3942 125<sup>th</sup> Avenue SW, South Heart North Dakota.

The revisions relate to increasing the Baghouse stacks to 65' for Baghouses 1, 2 and 4. We have also increased the size of the Emergency Generator from 150kw to 350kw to ensure sufficient power to shut down the plant in the event of an emergency.

The application contents are summarized as follows:

- AP100 – Air Contaminant Sources
- AP101 – Fuel Burning Equipment for Indirect Heating (Gas Fired Boiler)
- AP102 – Manufacturing and Processing Equipment
- AP109 Baghouse 1 – Gas Cleaning Equipment (Truck Dump)
- AP109 Baghouse 2 – Gas Cleaning Equipment (Raw Coal)
- AP109 Baghouse 3 – Gas Cleaning Equipment (Dryer)
- AP109 Baghouse 4 – Gas Cleaning Equipment (Product Coal)
- AP113 – Internal Combustion Engines (Emergency Generator)

Supporting these application documents is Attachment 1 – Revised Taggart Global LLC Report dated 23 January 2009 and Attachment 2 – Revised Plot Plan.

Any questions please call John Shultz.

Kind Regards

Robert R French  
Chief Executive Officer - GTL Energy (USA) Limited

CC: John Shultz, GTL Energy  
David Bass, Taggart Global LLC Project Manager

**Attachment 1 – Revised Taggart Global LLC Report dated 23 January 2009**

---

2090 Greentree Road  
Pittsburgh, PA 15220  
Phone: 412-429-9800  
Fax: 412-429-9801



Revision 1: January 23, 2009  
Initial Submittal: October 23, 2008

Robert French  
GTLE Dakota Plant 1 LLC  
6215 Cottonwood Shores Drive  
WELLINGTON CO 80549

Dear Robert

### **GTLE Energy (GTLE): PROCESS DESCRIPTION, EMISSION CALCULATIONS, AND EQUIPMENT SPECIFICATIONS REPORT**

We have prepared a summary of the emission points and emission calculations from the coal beneficiation plant to be constructed and operated at 3942 125th Avenue SW, South Heart North Dakota ("GTLE Dakota Plant 1"), based on the Site Plan, General Arrangement and Process Flow.

We have had access to a confidential report prepared by Hazen Research Inc, dated 7 October 2008, and as appropriate we have included extracts from that report which summarize the GTLE pilot operations in Golden, Colorado. Emission calculations were based on this report and vendor information.

#### **Process Description**

The GTLE proprietary technology uses mechanical equipment for preparation and handling of coal coupled with low temperature drying. The process includes stock pile stacking, coal conveying, coal crushing, and coal drying. No binders or chemical reagents are used in the process. The inputs are low rank coal, low temperature steam (which will be generated by a gas fired boiler) and electricity.

The objective of drying the coal is to reduce the moisture and in turn increase the energy content (BTU value) per ton of product. This drying process is performed safely by using low temperatures indirectly. The steam used to heat the coal is designed not to exceed 300 degrees F. The dryer has been designed so that the resulting temperature of the coal will not exceed 150 degrees F. As a result of the use of indirect low temperature drying, hazardous air toxics are not generated in the drying process based on the report generated by Hazen Research. Sweep air is used in the dryer to collect the water vapor removed from the coal. The sweep air will contain primarily dust (fine coal particles), the majority of which is removed by a cyclone followed by a baghouse, and small amounts of volatile organic compounds. Raw coal preparation and product handling will be controlled by baghouses. All of the dust collected by the cyclone and baghouses is reintroduced to the GTLE Process and ends up in the briquette product.

Using this technology, strong, high-energy coal briquettes containing in the order of up to 80% less moisture have been produced from ten different North Dakota lignites. The energy content (BTU) of the coals is raised by approximately 60%. Detailed test programs have all shown that the North Dakota lignites can be transformed into a premium briquette that is in many ways superior to coal presently being imported into North Dakota from Montana and Wyoming.

## Emission Estimates

We have determined the following total emission estimates for the Dakota Plant 1 based on process flow, vendor equipment specifications, and the Hazen Research Report.

### API01 – Fuel Burning Equipment for Indirect Heating (Gas Fired Boiler)

Table 1 below sets out the emission estimate calculations for the natural-gas fired boiler. These estimates are based on information provided by the vendor, Cleaver Brooks. A copy of the Cleaver Brooks vendor information is included as Exhibit A and estimated maximum emissions are provided below in Table 1.

Table 1. Emission Calculations for GTLE Gas Fired Boiler

Firing Rate		25%	50%	75%	100%
Horse Power:		375	750	1125	1500
Btu/hr:		1.53E+07	3.06E+07	4.59E+07	6.12E+07
Emission Performance					
CO	ppm	150	50	50	50
	lb/MMBtu	0.109	0.037	0.037	0.037
	lb/h	1.68	1.12	1.68	2.24
	stpy	7.34	4.89	7.34	9.79
NO <sub>x</sub>	ppm	30	30	30	30
	lb/MMBtu	0.035	0.035	0.035	0.035
	lb/h	0.54	1.08	1.62	2.16
	stpy	2.37	4.73	7.1	9.47
SO <sub>x</sub>	ppm	1	1	1	1
	lb/MMBtu	0.001	0.001	0.001	0.001
	lb/h	0.015	0.031	0.046	0.061
	stpy	0.07	0.13	0.2	0.27
HC/ VOC <sub>s</sub>	ppm	40	40	40	40
	lb/MMBtu	0.016	0.016	0.016	0.016
	lb/h	0.245	0.49	0.735	0.98
	stpy	1.07	2.15	3.22	4.29
PM	ppm	NA	NA	NA	NA
	lb/MMBtu	0.01	0.01	0.01	0.01
	lb/h	0.153	0.306	0.495	0.612
	stpy	0.67	1.34	2.01	2.68
Exhaust Data					
Temperature	°F	358	364	369	374
Flow	ACFM	5,654	9,622	14,520	19,477
	SCFM	3,533	5,968	8,953	11,937
	lb/hr	15,889	26,845	40,267	53,689
Velocity	ft/sec	13.34	22.70	34.25	45.95
	ft/min	800.20	1361.90	2055.20	2756.80
Notes:					
1. All ppm levels are corrected to 3 % oxygen					
2. Fuel input is based on 82% boiler efficiency					

*AP109 Baghouse 1 – Gas Cleaning Equipment (Truck Dump)*

Table 2 below sets out the emission estimate calculations for the Truck Dump Baghouse 1. These estimates are based on information provided by the vendor, Air Cure Inc. A copy of the Air Cure Inc vendor information is included as Exhibit B and are maximum emission guarantees by Air Cure.

Table 2. Emission Calculations for GTLE Dust Collector Baghouse 1

Truck Dump Baghouse 1	Air Flow	Loading					
		gr/dry std ft <sup>3</sup>	gr/min	lb/min	lb/hr	hr/yr	PM st/yr
Unit	ft <sup>3</sup> /min						
Model 484RF10	35,000	0.005	175	0.025	1.5	8,760	6.57

*AP109 Baghouse 2 – Gas Cleaning Equipment (Raw Coal)*

Table 3 below sets out the emission estimate calculations for the Raw Coal Baghouse 2. These estimates are based on information provided by the vendor, Air Cure Inc. A copy of the Air Cure Inc vendor information is included as Exhibit B and are maximum emission guarantees by Air Cure.

Table 3. Emission Calculations for GTLE Dust Collector Baghouse 2

Raw Coal Baghouse 2	Air Flow	Loading					
		gr/dry std ft <sup>3</sup>	gr/min	lb/min	lb/hr	hr/yr	PM st/yr
Unit	ft <sup>3</sup> /min						
Model 376RF10	24,100	0.005	120.5	0.017	1.03	8,760	4.52

*AP109 Baghouse 3 – Gas Cleaning Equipment (Dryer)*

Table 4 below sets out the dust emission estimate calculations for the Dryer Baghouse 3. These estimates are based on information provided by the vendor, Air Cure Inc. A copy of the Air Cure Inc vendor information is included as Exhibit B and are maximum emission guarantees by Air Cure.

Table 4. Dust Emission Calculations for GTLE Dust Collector Baghouse 3

Dryer Baghouse 3	Air Flow		Loading					
	ACFM	DSCFM	gr/dry std ft <sup>3</sup>	gr/min	lb/min	lb/hr	hr/yr	PM st/yr
Unit								
Model 376RF12	25,508	7,565	0.02	151.3	0.022	1.297	8,760	5.68

Table 5 below sets out emissions of Volatile Organic Compounds (VOC) from the Dryer Baghouse 3. These estimates are based on information provided by Hazen Research Inc, based on operation and emissions testing of the GTLE Pilot Plant including the average value from 780 samples of the dryer sweep air.

Table 5. VOC Emission Calculations for GTLE Dust Collector Baghouse 3

Dryer Baghouse 3	Air Flow		Loading (VOC)					
	ACFM	PPM	ACFM	lb/ft <sup>3</sup>	lb/min	lb/hr	hr/yr	VOC st/yr
Unit								
Model 376RF12	25,508	2.12	0.054	0.120	0.006	0.389	8760	1.71

**AP109 Baghouse 4 – Gas Cleaning Equipment (Product Coal)**

Table 6 below sets out the emission estimate calculations for the Product Coal Baghouse 4. These estimates are based on information provided by the vendor, Air Cure Inc. A copy of the Air Cure Inc vendor information is included as Exhibit B and are maximum emission guarantees by Air Cure.

**Table 6. Emission Calculations for GTLE Dust Collector Baghouse 4**

Product Coal Baghouse 4 Unit	Air Flow ft <sup>3</sup> /min	Loading					
		gr/dry std ft <sup>3</sup>	gr/min	lb/min	lb/hr	lb/yr	PM st/yr
Model 232RF10	15,100	0.005	75.5	0.011	0.66	8,760	2.89

**AP113 – Internal Combustion Engines (Emergency Generator)**

Table 7 below sets out the emission estimate calculations for the Emergency Generator. These estimates are based on information provided by the vendor, Cat Generator Systems. A copy of the Cat Generator Systems vendor information is included as Exhibit C.

**Table 7. Emission Calculations for GTLE Emergency Generator**

Emergency Generator Model DM5441 Unit	Loading				
	g/hp-hr	g/hr	lb/hr	lb/yr	st/yr
NOx	21.3	10,011	22.05	500	5.51
CO	1.5	705	1.55	500	0.39
HC	1.9	893	1.97	500	0.49

**Total Emission Calculations**

Based on the foregoing, we have estimated the total emissions from GTLE Dakota Plant 1, as set out in form AP102 – Manufacturing and Processing Equipment. This information is summarized and restated in Table 7 as follows:

**Table 8. Air Contaminants Emitted for GTLE Dakota Plant 1**

Number – Emission Point (See Table 9)	Pollutant	Amount		Basis of Estimate
		Pounds/Hr	Tons/Yr	
1, 6*	CO	2.24	10.18	Manufacturer's estimate
1, 6*	NOx	2.16	14.98	Manufacturer's estimate
1, 4, 6	VOC/HC	1.37	6.49	Manufacturer's estimate & lab tests
1, 2, 3, 4, 5	Particulate	5.10	22.34	Manufacturer's estimate

\*Total emissions include CO, NOx, and VOCs from the Emergency Generator assuming 500 hours per annum, whereas Boiler Stack is based on 8,760 hours per annum. Emergency Generator emissions are not included in "Pounds/Hr."

## Stack Summary

Table 9 below sets out the boiler and baghouse stack information for Dakota Plant 1.

Table 9. Stack Summary / Emission Points for GTLE Dakota Plant 1

Number – Emission Point	Stack Height (ft)	Stack Diameter (in at top)	Gas Volume (ACFM)	Exit Temp (F)	Gas Velocity (fps)
1: Boiler Stack	60	36"	19,477	277	40-50
2: Baghouse 1 Truck Dump	65	44"	35,000	Ambient	40-50
3: Baghouse 2 Raw Coal	65	36"	24,100	Ambient	40-50
4: Baghouse 3 Dryer	60	38"	25,508	200	40-50
5: Baghouse 4 Product Coal	65	29"	15,100	Ambient	40-50
6: Emergency Generator	8	8"	2476	892	118

Please contact me if you have any questions.  
Regards

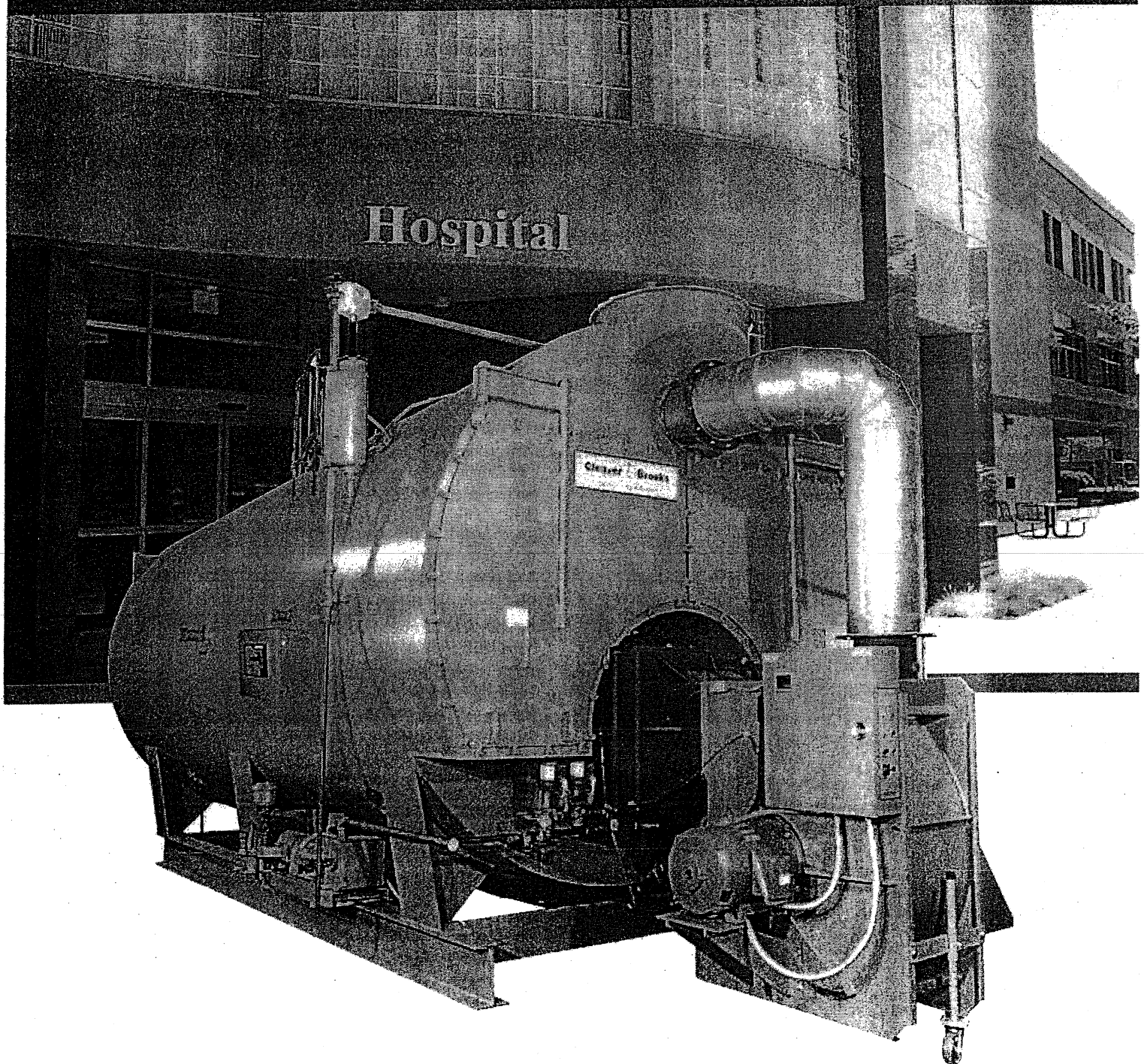
David Bass  
Project Manager

Enc.    Exhibit A – Cleaver Brooks Vendor Information  
         Exhibit B – Air Cure Inc Vendor Information  
         Exhibit C – Cat Generator Systems Vendor Information

**Exhibit A – Cleaver Brooks Vendor Information**

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## Model CBL Low Emission and High Efficiency Firetube Boilers



**Steam & Hot Water 900-1800 HP  
3 or 4 pass Wetback Design**

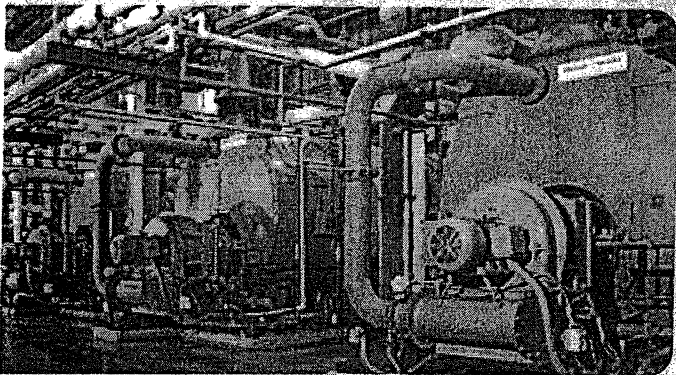
*Value Solutions for Commercial  
and Industrial Applications*

# THE CBL ADVANTAGE

**EFFICIENT • RELIABLE**

**FLEXIBLE • SAFE**

**EASY-TO-OPERATE**



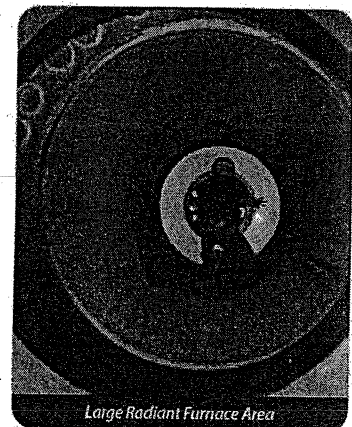
- **Three-Pass or Four-Pass Wetback Design**
- **8 Sizes from 800 thru 1800 Horsepower**  
4.0 & 5.0 square feet per BHP
- **Steam**  
High design pressure 150 psig thru 250 psig
- **Fuel Flexibility**  
Fire Natural Gas, No. 2 Oil, No. 6 Oil, Combination Gas/Oil, Propane/Air Mix
- **Fireside Accessibility**  
Clean-out door in rear combustion chamber with Pyrex Observation Port
- **Shell Insulated, Covered with Heavy Gauge Jacket, and Painted**
- **Boiler/Burner Package From One Manufacturer**
- **Rigorous Quality Control**  
Factory tested and field start-up
- **Meets Industry Standards**  
ASME Code; National Board of Pressure Vessel Inspectors, NEC
- **Burner Selected to Fit Your Needs**

## CLEAVER-BROOKS MODEL CBL

This three or four pass wet-back firetube boiler is ruggedly constructed for hot water or low and high pressure steam applications. Ranging in size from 900-1800 horsepower, this gas, #2 oil, #6 or combination fired product is a highly engineered and fully compatible boiler/burner package featuring excellent fuel to steam/water efficiency, space savings, low emissions, and optional upgrades.

**Excellent efficiency:** Attaining high fuel to steam/water efficiencies, in excess of 80%, does not happen by chance. It requires exacting combustion and heat transfer design to assure optimum performance throughout the entire firing range. The model CBL's precise matching of the advanced Profire D, S & LNS (100 & 30 PPM) and Profire NT (15 - <9 PPM) burners to the heat exchanging furnace and convection section is without precedent.

**Compact design:** With ever rising mechanical room construction costs, it's critical that the design team creates a boiler package that conserves every inch of your valuable floor space. The Cleaver-Brooks CBL large furnace area allows over 35% of the energy to be absorbed in the furnace. This means a shorter boiler overall; therefore, considerably less space is required. A significant consideration when construction budgets or boiler rooms are tight!



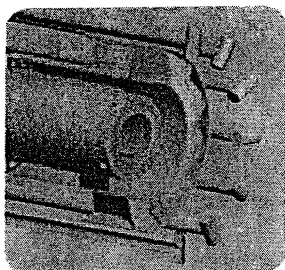
Large Radiant Furnace Area

**Low emissions:** Lowering emissions in the Cleaver-Brooks CBL involves two key factors; (1) advanced burner design and (2), the proper sizing of the furnace to minimize nitrogen oxides and other contaminants from forming during the combustion process.

Given these dynamics, the CBL can be equipped with one of two different burner designs depending on the degree of NOx reduction desired... If medium reduction is sufficient, the Profire LN burner will be applied delivering a maximum of 100 or 30 PPM when burning natural gas and employing FGR. If high reduction is desired, the Profire NT becomes part of the package, delivering 15 - <9 PPM on natural gas.

**Optional upgrades:** The versatile Cleaver-Brooks CBL can be easily upgraded with options during manufacture, or they can be retrofitted later...

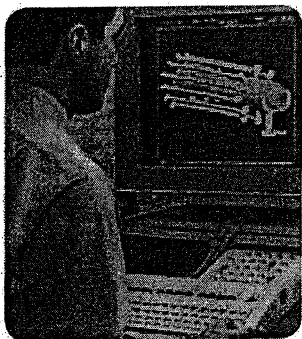
# HIGHEST GUARANTEED FUEL-TO-STEAM EFFICIENCY ON FOUR-PASS BOILERS



- The standard Profire burner can be changed to the **Profire LN or NT burner** providing the maximum in combustion efficiency and low NOx technology.

- Upgrade the standard burner management control to the **Hawk ICS...**

A totally integrated PLC based control system embodying precise boiler/burner management, safety, interconnectivity and high powered communications in a single package.



As in all of our highly engineered boiler offerings, it starts with computational fluid dynamics (CFD) determining optimum burner performance and furnace geometry fit delivering:

- **Highly efficient** fuel burning packages with excellent turndown on gas and #2 oil.

- **Accurate fuel/air ratio control** with 14 point adjustment cam(s), simple linkage assembly and Cleaver-Brooks Profire burner's unique rotary air damper.
- **Low emission options** ranging from 100, 30, 15 to <9 PPM on natural gas and 120 PPM on #2 oil.
- **Ease of setup and adjustment** of the fuel/air and FGR when applicable.
- **Easy access** to burner components with swing out burner assembly.
- **Optimum safety** with state of the art burner management and limiting control schemes.

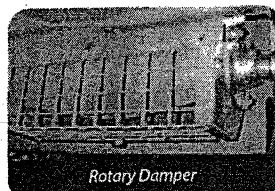
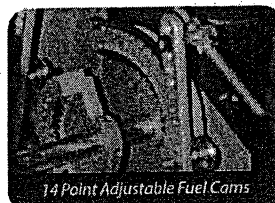
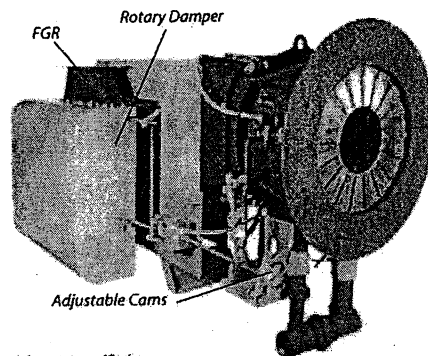
## AND THE REAL DIFFERENCE IS FOUND INSIDE...

### Burner and Furnace Compatibility

Optimum combustion and heat transfer begins with the fuel and air delivery system and progresses to the firing head where the proper amounts of fuel and air are united to form a combustible mix resulting in the highest combustion efficiency and lowest emissions. Compatibility of the burner and furnace is therefore critical...

## LOWERING EMISSIONS

Maximizing efficiency and minimizing emissions requires excellent burner design and burner compatibility for flame shaping and temperature control throughout the entire firing range. It is critical in reducing NOx formation and maximizing fuel to steam/water efficiency.



The CBL line of firetube boilers offers low NOx gun burners with and without flue gas recirculation (FGR) affording a range of NOx maximums depending on the given application. Available in 100 (no FGR), 30, 15, to <9 PPM NOx when burning natural gas, this line covers the gamut when it comes to meeting increasingly stringent air regulations.

## STANDARD EQUIPMENT

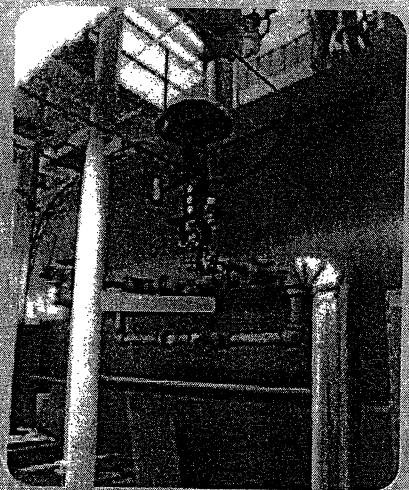
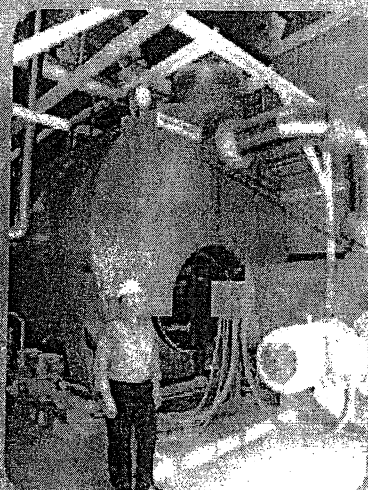
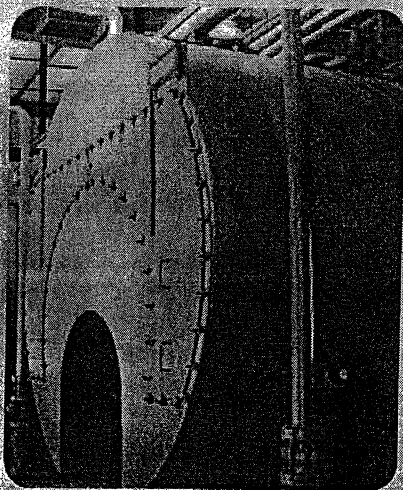
- Hinged forced draft burner allowing for ease of maintenance
- CB120E Flame Safeguard Control
- Levelmaster low water cut off and level control standard on high pressure steam
- Modulating Feedwater Valve to maintain the boiler water level within normal limits.
- Feedwater three valve bypass
- Low Water Cutoff is wired into the burner control circuit to prevent burner operation if the boiler water falls below a safe level
- Auxiliary Low Water Control – external probe type with manual reset
- 3" tubes provide optimum performance and minimize maintenance
- Hinged rear access plug
- Davited front and rear doors

# SETTING THE STANDARD

## CBL OPTIONAL EQUIPMENT

- Seismic Design
- NFPA8501 Requirements
- Blowdown Valves
- Flame Safeguard Controllers
- Non-Return Valves
- Hawk ICS
- Low NOx Equipment
- FM/IRI Insurance

## AUTHORIZED SALES, SERVICE, & PARTS, WORLDWIDE



## BEHIND EVERY CLEAVER-BROOKS BOILER AND ACCESSORY STANDS THE LARGEST BOILER SERVICE ORGANIZATION IN THE WORLD

Service and replacement parts for CBL boilers – or any Cleaver-Brooks boiler room products – are available from your local, Cleaver-Brooks authorized Representative. Cleaver-Brooks maintains a policy of prompt response to your needs that continues throughout the life of the product. You can call on us at the time of start-up for on-site assistance from factory-trained experts...or training of operating personnel. In short, you get just the kind of attention you'd

expect from the world's leading producer of packaged boilers and boiler room auxiliary equipment. For details on how we can serve you, contact your nearest authorized representative. For a complete list of authorized Representatives and other information on Cleaver-Brooks, visit us at [www.cleaver-brooks.com](http://www.cleaver-brooks.com)

**CLEAVER-BROOKS**  
*The power of commitment.*

800-250-5883 • [info@cleaver-brooks.com](mailto:info@cleaver-brooks.com)  
[www.cleaver-brooks.com](http://www.cleaver-brooks.com)



CB-7481  
08/07  
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**Exhibit B – Air Cure Inc Vendor Information**



## PROPOSAL

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### Terms and Conditions

#### Price Basis

Price quotes are firm for delivery by May, 2009. If delivery is extended beyond this date the price is subject to adjustment.

#### Shipment

To be determined.

#### Final Destination

GTL Energy – South Heart Plant  
North Dakota

#### Terms of Payment

15% After submittal of engineering approval drawings

85% - Net 30 Days. After shipment of equipment or notice of readiness to ship.

#### Sales Tax

Sales tax has not been included in the quoted price.

#### Validity

This offer is valid for 30 days. Any order resulting from this proposal is subject to our written acceptance.

#### Conditions of Sale

This offer is subject to Air-Cure Inc.'s Standard Terms and Conditions.

#### Design Changes

As the policy of Air-Cure Inc. is one of continued development and improvement, all Specifications and Equipment are subject to change for which reasonable notice will be given in writing.

#### Warranty

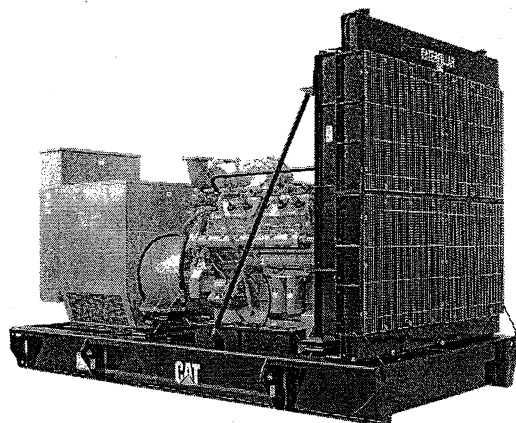
Warranty period is twelve (12) months from date of initial operation or eighteen (18) months from shipment, whichever occurs first.

#### Emission Guarantee

Air-Cure Inc. guarantees the emission rate through the filters on system #1 and #2 and #4 will not exceed .005 gr / dscf. as long as the units are installed and operated per Air-Cure Inc. instructions and original O.E.M. filter bags are used. This guarantee is in accordance with the new EPA code 40 CFR part 60, subpart y.

On system #3 (Dryer system) the maximum emission rate will not exceed .02 gr. / dscf. as proposed in the new EPA code 40 CFR part 60, subpart y.

**Exhibit C – Cat Generator Systems**



## STANDBY 350 kW CONTINUOUS 350 kW

60 Hz

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

### FEATURES

#### FULL RANGE OF ATTACHMENTS

- Wide range of bolt-on system expansion attachments, factory designed and tested

#### SINGLE-SOURCE SUPPLIER

- **Fully Prototype Tested** with certified torsional vibration analysis available

#### WORLDWIDE PRODUCT SUPPORT

- Worldwide parts availability through the Caterpillar dealer network
- With over 1,200 dealer outlets operating in 166 countries, you're never far from the Caterpillar part you need.
- 99.5% of parts orders filled within 48 hours. The best product support record in the industry.
- Caterpillar dealer service technicians are trained to service every aspect of your electric power generation system.
- Preventive maintenance agreements
- The Cat Scheduled Oil Sampling (S•O•S<sup>SM</sup>) program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products



#### CAT® G3412 TA GAS ENGINE

- Reliable, rugged, durable design
- Field-proven in thousands of applications worldwide
- Low pressure gas



#### CAT SR4B GENERATOR

- Designed to match performance and output characteristics of Caterpillar engines
- Optimum winding pitch for minimum total harmonic distortion and maximum efficiency
- Segregated AC/DC, low voltage accessory box provides single point access to accessory connections



#### CAT CONTROL PANELS

- Two levels of controls, designed to meet individual customer needs:
  - EMCP II provides digital monitoring, metering, and protection
  - EMCP II+ provides EMCP II features along with full-featured power metering and protective relaying

**STANDBY 350 ekW**  
**CONTINUOUS 350 ekW**  
**60 Hz**

**CATERPILLAR®**

## FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

System	Standard	Optional
Air Inlet	Single element canister type air cleaner Service indicator	
Cooling	Radiator with guard Coolant drain lines with valves Fan and belt guards Caterpillar Coolant Low coolant level sensors	Jacket water coolant heater with shutoff valves Radiator removal
Exhaust	Stainless steel exhaust flex with weld outlet flange	15 dBA muffler
Fuel	Gas pressure regulator Low pressure fuel system Energize To Run (ETR) gas shutoff valve	
Generator	Self excited Class H insulation Class F temperature rise (105° C continuous/130° C standby) VR6 Voltage Regulator, 3-phase sensing, with reactive droop 2:1 Volts/Hz or 1:1 Volts/Hz Bus bar termination Extension box	Permanent magnet excited Digital Voltage Regulator Digital Voltage Regulator with KVAR/PF control Anti-condensation space heater Oversize & premium generators Circuit breakers, UL, 3 pole with shunt trip Multiple breaker capability
Governor	2301A speed control with EG3P actuator	Electronic load sharing
Ignition	Digital ignition system	
Control Panels	EMCP II	EMCP II+ Customer Communication Module Local alarm & remote annunciator modules
Lube	Lubricating oil and filter Oil drain line with valve Fumes disposal	Manual sump pump
Mounting	Wide base Linear vibration isolators between base and engine-generator	
Starting/Charging	35 amp charging alternator 24 volt starting motor Batteries with rack and cables Battery disconnect switch	Battery chargers, 5 & 10 amp Oversize batteries
General		Automatic Transfer Switches (ATS) Floor standing circuit breakers

## SPECIFICATIONS



### CAT SR4B GENERATOR

Frame..... 592  
Type ..... Self excited, static regulated, brushless  
Construction ..... Single bearing, close coupled  
Three phase ..... 12 lead reconnectable  
Insulation ..... Class H with tropicalization and antiabrasion  
IP rating ..... Drip proof 22  
Alignment ..... Pilot shaft  
Overspeed capability  
Prototype tested ..... 150%  
Production tested ..... 125%  
Wave form ..... Less than 5% deviation  
Paralleling capability ..... Standard  
Voltage regulator ..... 3-phasing sensing with Volts-per-Hertz  
Voltage regulation ..... Less than  $\pm 1/2\%$  (steady state)  
Less than  $\pm 1\%$  (no load to full load)  
Voltage gain ..... Automatic  
Telephone Influence Factor (TIF) ..... Less than 50  
Harmonic Distortion (THD) ..... Less than 5%



### CAT ENGINE

G3412 TA, 4-stroke-cycle, SCAC  
Bore - mm (in) ..... 137 (5.4)  
Stroke - mm (in) ..... 152 (6.0)  
Displacement - L (cu in) ..... 27.0 (1649)  
Compression ratio ..... 9.7:1  
Aspiration ..... Turbocharged-Aftercooled  
Ignition system ..... Digital ignition  
Governor type ..... Woodward 2301A



### CAT CONTROL PANEL

24 Volt DC Control  
NEMA 1, IP22 enclosure  
Electrically dead front  
Lockable hinged door  
Generator instruments meet ANSI C-39-1  
Terminal box mounted  
Single location customer connector point

Consult your Caterpillar dealer for available voltages.

**STANDBY 350 ekW**  
**CONTINUOUS 350 ekW**  
**60 Hz**

**CATERPILLAR®**



## TECHNICAL DATA

Open Generator Set — 1800 rpm/60 Hz/480 Volts			Standby DM5441		Continuous DM5442	
<b>Package Performance</b>			350 438		350 438	
Power rating	ekW					
Power rating @ 0.8 PF	kVA					
Aftercooler temperature	Deg C	Deg F	54	130	54	130
<b>Fuel Consumption</b>						
100% load with fan	N•m³/hr	scf/hr	119	4472	119	4472
75% load with fan	N•m³/hr	scf/hr	95	3575	95	3575
50% load with fan	N•m³/hr	scf/hr	72	2701	72	2701
<b>Cooling System</b>						
Ambient air temperature*	Deg C	Deg F	40	105	40	105
Air flow restriction (system)	kPa	in water	0.12	0.5	0.12	0.5
Air flow (maximum @ rated speed for standard radiator arrangement)	m³/min	cfm	1257	47,480	1257	47,480
Engine coolant capacity with radiator	L	Gal	106	28	106	28
Jacket water outlet temperature	Deg C	Deg F	99	210	99	210
<b>Exhaust System</b>						
Combustion air inlet flow rate	N•m³/min	scfm	24	872	24	872
Exhaust gas stack temperature	Deg C	Deg F	478	892	478	892
Exhaust gas flow rate	N•m³/min	cfm	25	2476	25	2476
Exhaust flange size (internal diameter)	mm	in	203	8	203	8
Exhaust system backpressure (maximum allowable)	kPa	in water	6.7	27	6.7	27
<b>Heat Rejection</b>						
Low Heat Value (LHV) fuel input	kW	Btu/min	1205	68,547	1205	68,547
Heat rejection to jacket water (includes oil cooler)	kW	Btu/min	437	24,869	437	24,869
Total heat rejection to exhaust (LHV to 25° C)	kW	Btu/min	283	16,067	283	16,067
Heat rejection to exhaust (LHV to 120° C)	kW	Btu/min	218	10,412	218	10,412
Heat rejection to A/C	kW	Btu/min	15	866	15	866
Heat rejection to atmosphere from engine	kW	Btu/min	48	2742	48	2742
Heat rejection to atmosphere from generator	kW	Btu/min	29	1660	29	1660
<b>Generator</b>						
Motor starting capability @ 30% voltage dip**	kVA		928		928	
Frame			592		592	
Temperature rise	Deg C		130		105	
<b>Emissions***</b>						
NOx	g/bhp-hr		21.3		21.3	
CO	g/bhp-hr		1.5		1.5	
HC (total)	g/bhp-hr		1.9		1.9	
HC (non-methane)	g/bhp-hr		0.29		0.29	
Exhaust O₂ (dry)	%		4.0		4.0	

\*Ambient capability at 200 m (660 ft) above sea level. For ambient capability at other altitudes, consult your Caterpillar dealer.

\*\*Assumes synchronous driver

\*\*\*Emissions data measurement is consistent with those described in EPA CFR 40 PART 89 SUBPART D and ISO 8178-1 for measuring HC, CO, CO₂ and NOx. Data shown is based on steady state engine operating conditions of 77° F, 28.43 inches HG and fuel having a LHV of 920 BTU per cubic foot at 30.00 inches HG absolute and 32° F. Not to exceed emission data shown is subject to instrumentation, measurement, facility and engine fuel system adjustments.

## RATING DEFINITIONS AND CONDITIONS

**Standby** — Output available with varying load for the duration of the interruption of the normal source power.

**Continuous** — Output available without varying load for an unlimited time.

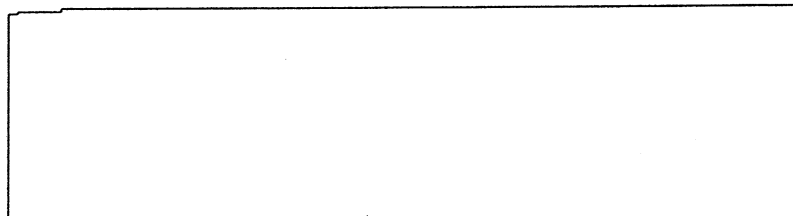
**Ratings** are based on ISO3046/1 standard reference conditions of 25° C (77° F) and 100 kPa (29.61 in Hg).

**Ratings** are based on pipeline natural gas having a LHV (low heat value) of 36.2 mJ/N•m³ (920 Btu/cu ft). Variations in altitude, temperature, and gas composition from standard conditions or the use of a three way catalyst may require a reduction in engine horsepower.

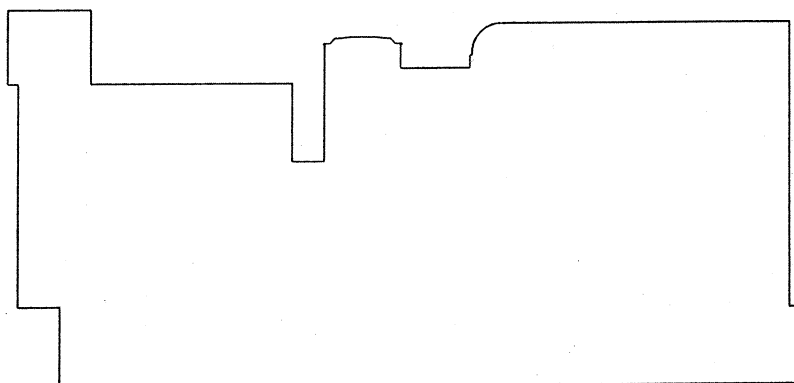
**S T A N D B Y                      3 5 0   e k W**  
**C O N T I N U O U S       3 5 0   e k W**  
**6 0   H z**

**CATERPILLAR®**

**STANDBY/CONTINUOUS POWER GENERATOR SET PACKAGE — TOP VIEW**



**STANDBY/CONTINUOUS POWER GENERATOR SET PACKAGE — SIDE VIEW**



Package Dimensions		
Length	4543.1 mm	178.86 in
Width	2235.8 mm	88.02 in
Height	2466.4 mm	97.10 in
Shipping Weight	6356 kg	14,000 lb

Note: Do not use for installation design.  
See general dimension drawings  
for detail (Drawing #207-4502).

[www.CAT-ElectricPower.com](http://www.CAT-ElectricPower.com)

TMI Reference No.: DM5441, DM5442

U.S. sourced

LEHE1431 (06-01)

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Materials and specifications are subject to change without notice.  
The International System of Units (SI) is used in this publication.

## Attachment 2 – Revised Plot Plan

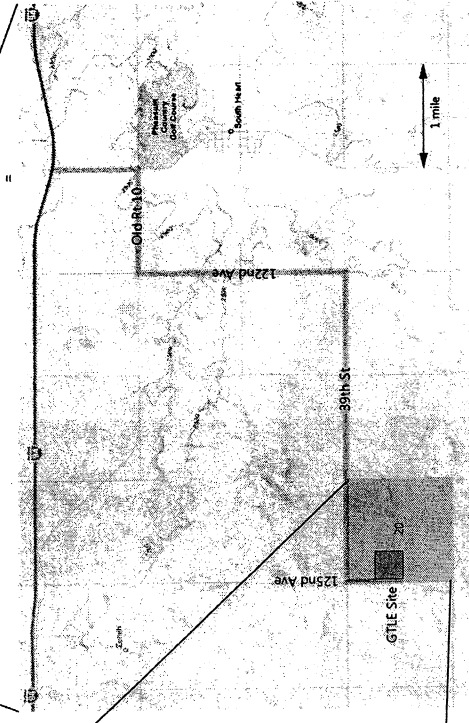
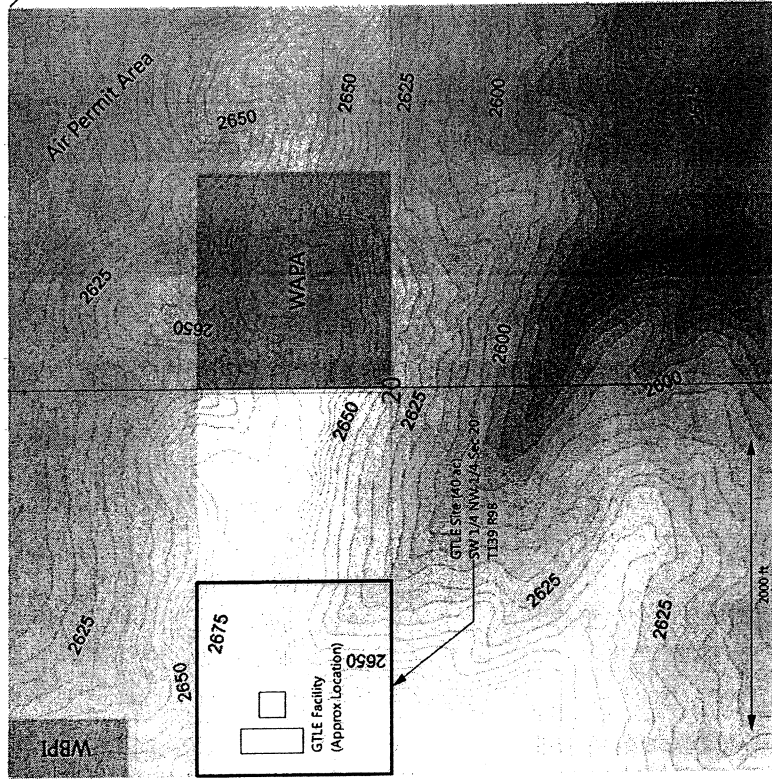
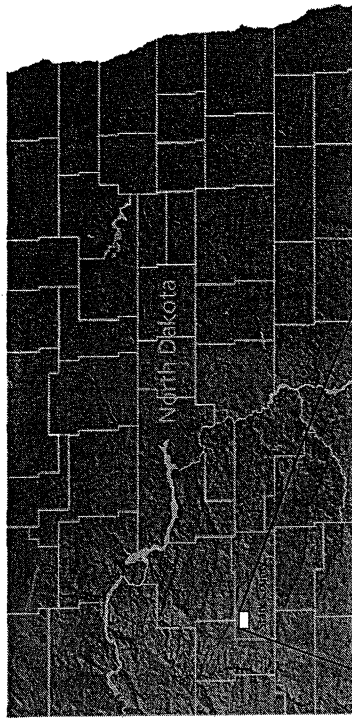




## Attachment 3 – Site Map



# Attachment 3

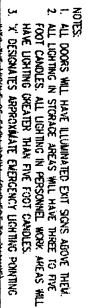


				GTL Energy Ltd			
				GTL Energy (USA) Ltd			
				South Heart Beneficiation Plant			
				Site Location Map			
				ENGINEER R. Reeves			
				SCALE AS NOTED			
				CLASS			
				DRAWN R. Reeves			
				CHECK			
				APPR 10305			

## Attachment 4 – 3D Rendering of the Buildings

file: Attachment 4 3D Buildings.mcd

## Attachment 5 – General Arrangement Plan View of Buildings



SCALE	-	DATE	7/21/2008
DESIGNED	REM		
BY			
BY	JL	10/20/2008	
CHECKED			
BY			
APPRO	-		
REVISION	-		
BY	APP		
DATE			

DRAWING TYPE: CA (DMS NO. 3141) - AIRPERMIT - ATTACHED 0  
 SOUTH HEART LIGNITE BENEFICIATION PROJECT  
 AIR PERMIT C.A.: PLANT PLAN VIEW, ATTACHMENT #5  
 CIL ENERGY

TAGGART GLOBAL  
 1400 GARDNER ROAD  
 MISSISSAUGA, ONTARIO  
 L4X 1L7

## Attachment 6 – General Arrangement Section View of Buildings

SCALE:		DATE:	12/08/2008
DESIGNED BY:	REV:	DATE:	11/17/2008
DRAWN BY:	JL	DATE:	10/24/2008
CHECKED BY:	-	DATE:	-
APPROVED BY:	-	DATE:	-
REVISION:	REV:	DATE:	-
NO.	DATE:	APPROVED BY:	-

**Ⓢ TAGGART GLOBAL**  
**G/L ENERGY**

SOUTH HEART LIGHT BENEFICIATION PROJECT  
 AIR PERMIT G.A.: MEWS "A-A" THRU "D-D", ATTACHMENT #6

Drawing Type : CA | DWG No. 3141-AIRPERMIT-ATT6 | REV 0

2300 OAKRIDGE RD. SUITE 200  
 RICHMOND, VA 23227  
 TEL: (804) 745-1100 FAX: (804) 745-1101  
 WWW.TAGGARTGLOBAL.COM





**AIR CONTAMINANT SOURCES PERMIT APPLICATION**  
**NORTH DAKOTA DEPARTMENT OF HEALTH**  
**DIVISION OF AIR QUALITY**  
**SFN 8516 (12-05) (AP 100)**

**FACILITY IDENTIFICATION**

Name of Firm or Institution GTLE Dakota Plant 1 LLC				
Owner or Official to Contact on Air Pollution Matters John Shultz (Contact)		Title		Telephone Number (701) 597-3006
Application Being Made By (Name): Robert French		Title CEO, GTL Energy, Ltd.		Telephone Number (970) 443-8040
Mailing Address (Street & No.) 6215 Cottonwood Shores Drive		City Wellington		State CO Zip Code 80549
Plant Location (Street & No.) 3942 125 <sup>th</sup> Ave SW		City South Heart	County Stark	State ND Zip Code 58655
Legal Description of Plant Site SW1/4NW1/4, Section 20, Twp.139W Range 98W		Latitude (Nearest Second) See Attachment 2		Longitude (Nearest Second) See Attachment 2
Land Area at Plant Site 40 Acres (or)		MSL Elevation at Plant 2687.0 MSL		

**GENERAL NATURE OF BUSINESS:**

DESCRIBE NATURE OF BUSINESS	STANDARD INDUSTRIAL CLASSIFICATION NUMBER
Coal Beneficiation	

**SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION:**

Assign your Identification Number (1, 2, 3, etc.) to each Source or Permit Unit. List ID Number and identify device below, then check appropriate category in the box to the right of listed device.		PERMIT TO CONSTRUCT				MINOR SOURCE PERMIT TO OPERATE						
YOUR ID NUMBER	SOURCE OR UNIT (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	NEW SOURCE	EXISTING SOURCE MODIFICATION, ALTERATION, REPAIRING, REBUILDING	EXISTING SOURCE EXPANSION	EXISTING SOURCE CHANGE LOCATION	NEW SOURCE	EXISTING SOURCE INITIAL APPLICATION	EXISTING SOURCE AFTER MODIFICATION, ALTERATION, REPAIRING, REBUILDING	EXISTING SOURCE AFTER EXPANSION	EXISTING SOURCE AFTER CHANGE OF LOCATION	EXISTING SOURCE AFTER CHANGE OF OWNERSHIP OR LESSEE	OTHER
1	Natural gas fired boiler and stack	X				X						
2	Baghouse #1 and stack-Truck Dump	X				X						

3	Baghouse #2 and stack- Raw Coal	X				X							
4	Baghouse #3 and stack- Dryer	X				X							
5	Baghouse #4 and stack- Product Coal	X				X							
6	Emergency generator and stack	X				X							

Other (Specify)

**IF APPLICATION IS FOR A PERMIT TO CONSTRUCT, PROVIDE THE FOLLOWING DATA:**

Name of Installer or Contractor Taggart Global LLC		Telephone Number (412) 429-9800
Mailing Address 2090 Greentree Road, Pittsburgh, PA 15220	Start Date/Construct October 14, 2008	Completion Date June, 2009

**ESTIMATED COST OF EQUIPMENT OR MODIFICATION (FOR PERMIT TO CONSTRUCT ONLY):**

Basic Equipment \$	Air Pollution Control Equipment Existing as of Date of Application \$
New Air Pollution Control Equipment to be Installed \$	Modification to Existing Air Pollution Control Equipment \$

**IDENTIFICATION OF AIR CONTAMINANTS (Check all which are emitted in measurable quantities into the atmosphere from any operation at this facility.)**

ARSENIC	CHLORINE COMPOUNDS	HYDROGEN SULFIDE	PESTICIDES
ASBESTOS	DUST	LEAD	RADIOISOTOPES
BERYLLIUM	FLUORINE COMPOUNDS	MERCURY	SILICIA
CADMIUM	x VOLATILE ORGANIC COMPOUNDS	x NITROGEN COMPOUNDS	SULFUR COMPOUNDS
x VISIBLE EMISSIONS	OTHER ORGANIC COMPOUNDS	ODORS	CHROMIUM COMPOUNDS
x CARBON MONOXIDE	OTHER (specify)	x PARTICULATES (specify)	

List Specific Compounds PM, PM10

Has Source Testing Been Done at the Facility? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Last Date when a Testing Program was Completed	If Program is Continuous, Give Approximate Testing Frequency:
--	--	---

**INDICATE WITH "X" WHICH OF THE FOLLOWING FORMS ARE ATTACHED AND MADE PART OF THE APPLICATION**

<input checked="" type="checkbox"/>	Fuel Burning Equipment Used for Indirect Heating	<input type="checkbox"/>	Rock, Sand and Gravel Processing
<input checked="" type="checkbox"/>	Manufacturing or Processing Equipment	<input checked="" type="checkbox"/>	Gas Cleaning Equipment (4 baghouses)
<input type="checkbox"/>	Incinerators	<input type="checkbox"/>	Volatile Organic Compounds Storage Tank
<input type="checkbox"/>	Grain, Feed, and Fertilizer Operations	<input checked="" type="checkbox"/>	Internal Combustion Engine Sources (Emergency Generator)
<input type="checkbox"/>	Asphalt Concrete Plants	<input type="checkbox"/>	Oil/Gas Production Facility Report
<input type="checkbox"/>	Concrete Batch Plants and Cement Handling Equipment	<input type="checkbox"/>	Hazardous Air Pollution (HAP) Sources

	Natural Gas Processing Plants		Contaminated Soil Treatment Facility

**OTHER ATTACHMENTS ARE AS FOLLOWS AND ARE A PART OF THIS APPLICATION:**

1. Taggart Global Report with process description, emission calculations, and equipment specifications	4. 3-D Diagram of Plant Site
2. Plot Plan with coordinates of site and stacks	5. General Arrangement: Plant Plan View
3. Site Location Map	6. General Arrangement: Views "A-A" THRU "D-D" (Section View)

I, the undersigned applicant, am fully aware that statements made in this application and the attached exhibits and statements constitute the application for Permit(s) to Construct and/or Operate Air Contaminant sources from the North Dakota Department of Health and certify that the information in this application is true, correct and complete to the best of my knowledge and belief. Further, I agree to comply with the provisions of Chapter 23-25 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand the permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Signature of Applicant <i>R R French</i>	Date <i>01-23-09</i>
--	----------------------

## INSTRUCTIONS

### SITE PLANS TO BE ATTACHED TO APPLICATION:

Prepare and attach a plot plan drawn to scale or properly dimensioned, showing at least the following:

- a. The property involved and the outlines and heights of all buildings on it. Identify property lines plainly. Also, indicate if there is a fence around the property that prevents public access.
- b. Location and identification of all existing or proposed equipment, manufacturing processes, etc., and points of emission or discharge of air contaminants to the atmosphere.
- c. Location of the facility or property with respect to the surrounding area, including residences, businesses and other permanent structures, streets and roadways. Identify all such structures and roadways. Indicate direction (**NORTH**) on the drawing and the prevailing wind direction.

### EQUIPMENT PLANS AND SPECIFICATIONS FOR PERMIT TO CONSTRUCT:

Supply plans and specifications, including as a minimum an assembly drawing, dimensioned and to scale, in plan, elevation and as many sections as are needed to show clearly the design and operation of the equipment and the means by which air contaminants are controlled. The following must be shown:

- a. Size and shape of the equipment. Show exterior and interior dimensions and features.
- b. Locations, sizes, and shape details of all features which may affect the production, collection, conveying, or control of air contaminants of any kind, location, size, and shape details concerning all material handling equipment.
- c. All data and calculations used in selecting or designing the equipment.
- d. Horsepower rating of all motors driving the equipment.

**NOTE: STRUCTURAL DESIGN CALCULATIONS AND DETAILS ARE NOT REQUIRED. WHEN STANDARD COMMERCIAL EQUIPMENT IS TO BE INSTALLED, THE MANUFACTURER'S CATALOG DESCRIBING THE EQUIPMENT MAY BE SUBMITTED IN LIEU OF ITEMS a, b, c, and d OF ABOVE, WHICH THE CATALOG COVERS. ALL INFORMATION REQUIRED ABOVE THAT THE CATALOG DOES NOT CONTAIN MUST BE SUBMITTED BY THE APPLICANT.**

### ADDITIONAL INFORMATION MAY BE REQUIRED:

If the application is signed by an authorized representative of the owner, a LETTER OF AUTHORIZATION must be attached to the application.

### SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
918 E Divide, 2nd Floor  
Bismarck, ND 58501-1947  
Telephone: (701)328-5188



**FUEL BURNING EQUIPMENT FOR INDIRECT HEATING PERMIT  
APPLICATION**  
NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY  
SFN 8518 (12-00) (AP-101)

**NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.**

**GENERAL**

Name of Firm or Organization GTLE Dakota Plant 1 LLC		Application Date October 27, 2008	
Name of Person Submitting Application Robert R. French	Title CEO, GTL Energy Ltd.		Telephone Number (970) 443-8040
Mailing Address (Street & No.) 6215 Cottonwood Shores Drive	City Wellington	State CO	Zip Code 80549
Plant Location 3942 125 <sup>th</sup> Ave. SW, South Heart, ND 58655			Source ID No. (AP100) 1

**EQUIPMENT**

Name of Manufacturer Cleaver-Brooks	Rated Capacity/Maximum Input 62.8 mmBtu/hr	Model Number CBL-700-1500
Purpose Space Heat % <input type="checkbox"/> Power Generation % X Process Heat 100 % <input type="checkbox"/> Other (Specify % if multi-purpose)		

**TYPE OF COMBUSTION UNIT AND FUEL FEEDING METHOD**

<input type="checkbox"/> COAL (If other solid fuel, specify here:  <input type="checkbox"/> Pulverized <input type="checkbox"/> General <input type="checkbox"/> Dry Bottom <input type="checkbox"/> Wet Bottom with Fly Ash Reinjection <input type="checkbox"/> Wet Bottom without Fly Ash Reinjection  <input type="checkbox"/> Spreader Stoker without Fly Ash Reinjection <input type="checkbox"/> Fluidized Bed <input type="checkbox"/> Cyclone <input type="checkbox"/> Hand-Fired <input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Fuel Oil  <input type="checkbox"/> Horizontally Fired <input type="checkbox"/> Tangentially Fired <input type="checkbox"/> Other - Specify: _____	X Gas  X Horizontally Fired <input type="checkbox"/> Tangentially Fired <input type="checkbox"/> Other - Specify: _____
---	--	---

**NORMAL SCHEDULE OF OPERATION**

Hours Per Day	Days Per Week	Weeks Per Year	Hours Per Year Total	Peak Season (Specify Months)
24	7	52	8760	

**TYPE AND QUANTITY OF FUEL EXPECTED TO BE USED IN A CALENDAR YEAR**

Year 20 10	PRIMARY FUELS			STANDBY FUELS		
	Type Natural Gas			Type NA		
	Quantity/Year 550,000 MCF		Units MCF	Quantity/Year		Units
	Maximum	Minimum	Average	Maximum	Minimum	Average
Percent Ash (Solids Fuel Only)						
Percent Sulfur						
BTU Per Unit (Specify):		1 million BTU/mcf	1 million BTU/mcf	1 million BTU/mcf		

**COMBUSTION AIR**

<input type="checkbox"/> Natural Draft	<input type="checkbox"/> Induced	X Forced	<input type="checkbox"/> Other - Specify: _____
--	----------------------------------	----------	---

**STACK DATA**

Height Above Grade 60 feet	Gas Temperature at Exit 277 degrees F	
Inside Diameter at Exit 36 inches	Gas Velocity at Exit 40-50 ft./sec.	
Stack Exit Gas Flow Rate	Average	Maximum
	14,520 ACFM	19,477 ACFM
Are sampling ports available? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes - Describe:  Sampling ports will be provided per State Dept of Health requirements.		
Describe Fuel Transport and Storage Methods  Natural gas will be supplied by pipeline. No fuel will be stored on the plant site.		
Is any air contaminant control device used in conjunction with this equipment: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - Attach a completed gas cleaning equipment form (SFN 8532 AP-109) to this application		

**NEARBY BUILDINGS**

Attach drawings which show the plan and elevation views of any nearby buildings including the building that houses the fuel-fired equipment.

**STACK EMISSIONS**

Pollutant	Maximum Pounds Per Hour*	Tons Per Year	Basis and Calculations for Quantities: See Attachment 1: Taggart Report.
Particulate	0.61	2.68	
PM <sub>10</sub>			
Sulfur Dioxide			
Nitrogen Oxide	2.16	9.47	
Carbon Monoxide	2.24	9.79	
Other - Specify Volatile organic compounds/hydrocarbons	0.98	4.29	

Signature of Applicant

X

RR French

Date

01-23-09

## INSTRUCTIONS

All applicable portions of this form should be completed by printing or typing. When any item is not applicable the letters "NA" should be placed beside the item.

For the purpose of this application, fuel burning equipment is defined as:

"Fuel-burning equipment" shall mean any furnace, boiler apparatus, stack, or appurtenances thereto used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer.

Fuel-burning equipment, other than smokehouse generators, which meet all of the following criteria are not required to obtain a Permit to Construct or Permit to Operate:

1. The aggregate heat input per unit does not exceed ten million British thermal units per hour.
2. The total aggregate heat input from all equipment does not exceed ten million British thermal units per hour.
3. The emissions from all equipment do not exceed twenty-five tons (22.67 metric tons) per year of any air contaminant.

A separate permit application should be submitted for each separate piece of fuel-burning equipment that requires a permit.

**RATED CAPACITY - MAXIMUM INPUT** shall be the equipment manufacturer's or designer's guaranteed maximum input, whichever is greater.

A description of the delivery to, storage on, and method of transporting fuels within the plant should be specified for all solid and liquid fuels used by this indirect heat exchanger. (Example: coal delivered by open truck, stored in open piles, and carried to boiler by conveyor belt system.)

**STACK EMISSIONS** - The maximum emission quantity per hour at the rated capacity using the primary fuel and the quantity per year emitted from actual use of the primary and secondary fuels combined should be entered here. The estimating basis for these quantities should be described. If emission factors are used, the source of these factors and the factors themselves should be identified.

**NOTE:** All information included in the application, including maximum estimated emission rates, will be used to make the above determinations. The information that is supplied in the application may be used to establish permit conditions. The emission rates provided should be based on the most credible data available. Although AP-42 provides general information, it should not be solely relied on to develop emission rates. Other sources of information that accurately represent the actual conditions that the emission unit will be operated under, such as actual test data or manufacturer's data, may be preferable.



**PERMIT APPLICATION - MANUFACTURING OR PROCESSING EQUIPMENT**  
**NORTH DAKOTA DEPARTMENT OF HEALTH**  
**DIVISION OF AIR QUALITY**  
SFN 8520 (AP 102) 12/00

**GENERAL** - Equipment items operating as a functional unit may be grouped as one application

Name of Firm or Organization GTLE Dakota Plant 1 LLC		Application Date October 27, 2008	
Name of Person Submitting Application Robert R. French		Phone (970) 443-6040	
Mailing Address (Street & No.) 6215 Cottonwood Shores Drive		City Wellington	State CO Zip Code 80549
Plant Location 3942 125 <sup>th</sup> Avenue, SW, South Heart ND 58655		Source ID No. (AP 100) 1 thru 6	
Type of Unit or Process (rotary dryer, cupola furnace, crusher, pelletizer, etc.): Coal beneficiation plant			
Make	Model	Date Installed	
Capacity (manufacturer's or designer's guaranteed maximum) 45 tons/hr. Plant feed.		Operating Capacity (Specific Units) 45 tons/hr. Plant feed.	
Brief description of operation of unit or process:  Coal will be crushed, dried, and briquetted.			

**NORMAL OPERATING SCHEDULE**

Hours per Day	Days per Week	Weeks per Year	Peak Production Season, If any	Dates of Annual Shutdown
24	7	52		

**RAW MATERIALS INTRODUCED INTO UNIT OR PROCESS** (Include solid fuels such as coke or coal - exclude indirect heat exchangers - Put that information on AP 101)

Material	Hourly Process Weight Rate Pounds per Hour			Average Annual (Specify Units) Short tons	Intermittent Operation Only (Average Hours/Week)
	Average	Maximum	Design		
Raw coal	90,000	90,000	90,000	394,200	

**PRODUCTS OF UNIT OR PROCESS** (Include all, even those not usable because they do not meet specifications)

Material	Hourly Process Weight Rate Pounds per Hour			Average Annual (Specify Units) Short tons	Intermittent Operation Only (Average Hours/Week)
	Average	Maximum	Design		
Dry coal in briquette form	60,000	60,000	60,000	262,800	

**FUELS USED** (Exclude heat supplied or indirect heat exchangers, list those on AP 101)

Coal (Tons/Yr)	% Sulfur	% Ash	Oil (Gal/Yr)	% Sulfur	Grade No.
Natural Gas (Thousand CF/Yr)		LP Gas (Gal/Yr)		Other (Specify)	

**EMISSION POINTS** (List each point separately, number each and locate on attached flow chart)

Number	Stack Height (ft)	Stack Diameter (inches at top)	Gas Volume (ACFM)	Exit Temp (F)	Gas Velocity (fps)
1- Boiler Stack	60	36	19,477	277	40-50
2-Baghouse #1 Truck Dump	65	44	35,000	Ambient	40-50
3- Baghouse#2- Raw Coal	65	36	24,100	Ambient	40-50
4-Baghouse #3 Dryer	60	38	25,508	200	40-50
5-Baghouse #4 Product Coal	65	29	15,100	Ambient	40-50
6-Emergency Generator stack	8	8	2,476	892	118

**AIR CONTAMINANTS EMITTED - Known or Suspected**

Use same identification number as above

Number	Pollutant	Amount		Basis of Estimate
		Pounds/Hr	Tons/Yr	
1 and 6	CO	2.24	10.18	NOTE: Tons /Yr includes Emergency Generator emissions and Pounds/Hr. does not include Emergency Generator emissions See Attachment 1
1 and 6	NOx	2.16	14.98	See Attachment 1
1, 4, and 6	VOC/HC	1.37	6.49	See Attachment 1
1, 2, 3, 4, and 5	Particulate	5.10	22.34	See Attachment 1

**ARE ANY VOLATILE ORGANIC COMPOUNDS STORED ON PREMISES**X NO ☐ YES - List Below

(See Rules 33-15, Section 33-15-01-04 for classes of compounds covered)

Material Stored	Size Tank (Gallons)	Vapor Control Device

**ARE ANY ORGANIC SOLVENTS USED OR PRODUCED?**X NO (None or less than 50 gallons per year) ☐ YES - identify below

Type	Principal Use	Gallons/Yr Consumed	Gallons/Yr Produced

**IS THERE ANY EMISSION CONTROL EQUIPMENT ON THIS UNIT OR PROCESS?** ☐ NO X YES - Attach form AP 109 (SFN 8532)

Does the input material or product from this process contain finely divided material which could become airborne? <input type="checkbox"/> NO X YES		Describe storage methods used Raw coal and product coal will be stored inside a building with dust controlled by baghouses.			
Storage Piles	Type of Material	Particle Diameter (Average Diameter or Screen Size)	Pile Size Average Tons	Pile Wetted (Yes or No)	Pits Covered (Yes or No)
See Attachment 5	Raw Coal	2"X 0"	800	No	Yes
See Attachment 5	Product coal	2"X 1"	1800	No	Yes
Describe any fugitive dust problems: None					

Attach additional sheets if needed to explain any answers. Use separate form for each process that emits contaminants.

Signature of Applicant <i>RR French</i>	Date 01-23-09
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# GAS CLEANING EQUIPMENT PERMIT APPLICATION

North Dakota Department of Health

Division of Air Quality

SFN 8532 (12-05) (AP-109)

NOTE: Please read instructions before completing this form.

## APPLICANT

Name of Firm/Organization GTLE Dakota Plant 1 LLC		Application Date October 27, 2008
Name of Person Submitting Application Robert R. French	Title CEO, GTL Energy Ltd.	Telephone Number (970) 443-8040
Plant Location 3942 125 <sup>th</sup> Ave SW, South Heart, ND, 58655		Source ID No. (AP-100) 2

## EQUIPMENT

Type	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input checked="" type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer
Name of Manufacturer Air-Cure, Inc.		Model Number 484RF10		Date To Be Installed Apr., 09		
Application <input type="checkbox"/> Boiler <input type="checkbox"/> Kiln <input checked="" type="checkbox"/> Other (Specify): System #1-Truck unload system (35,000 ACFM)						
Pollutants Removed	Particulate	Coal				
Design Efficiency	Emission rate =	0.005gr/dscf				
Operating Efficiency	Emission rate =	0.005gr/dscf				
Describe Method Used to Determine Operating Efficiency:  EPA Method 5 (Front half only)						

GAS CONDITIONS			INLET	OUTLET
Gas Volume (SCFM 68°F., 14.7 psia)			35,000 CFM	35,000 CFM
Gas Temperature (°F.)			Ambient	Ambient
Gas Pressure (in. H <sub>2</sub> O) Approx.			-16" W.C.	Atmospheric
Gas Velocity (ft/sec)			50	50
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration		
	Particulate (Coal)	gr./ACF	5-10 gr./ACF	0.005 gr./dscf
Pressure Drop Through Gas Cleaning Device			1-6" W.C. Maximum	

Signature of Applicant X <i>RR French</i>	Date 01-23-09
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## INSTRUCTIONS

Print or Type.

Complete this form for each piece of equipment or process, which has gas cleaning equipment installed, described in the following Permit Applications: Fuel Burning Equipment Used for Indirect Heating; Manufacturing or Processing Equipment; Incinerators; Grain, Feed and Fertilizer Operations; Asphalt Concrete Plants, Concrete Batch Plants and Cement Handling Equipment; and Rock, Gravel and Sand Plant.

Type of Equipment - If the type is not one of those listed, provide enough information so the operating principal of the equipment can be determined.

List each pollutant which the device is intended to control, the efficiency of removal intended by the designer, and the actual efficiency under operating conditions.

Please attach the following:

1. A brief description and sketch of the gas cleaning device if it is of unusual design, or used in conjunction with other control devices. Show any bypass of the device and specify the conditions under which the bypass is used.
2. A description of what is done with collected air contaminants from the time they are collected until they reach the final disposal point. Include a description of the transportation methods used.
3. If a stack test has been conducted, attach a copy of the results, date of the test, a description of the techniques used, and the name and address of the organization which performed the test.

**SUBMIT YOUR APPLICATION WITH ALL SUPPORTING DOCUMENTS, ALONG WITH THE FORMS SPECIFIED IN THE FIRST PARAGRAPH ABOVE, TO:**

North Dakota Department of Health  
Division of Air Quality  
918 E Divide, 2nd Floor  
Bismarck, ND 58501-1947

Telephone: (701)328-5188



# GAS CLEANING EQUIPMENT PERMIT APPLICATION

North Dakota Department of Health

Division of Air Quality

SFN 8532 (12-05) (AP-109)

NOTE: Please read instructions before completing this form.

## APPLICANT

Name of Firm/Organization GTLE Dakota Plant 1 LLC		Application Date October 27, 2008
Name of Person Submitting Application Robert R. French	Title CEO, GTL Energy Ltd.	Telephone Number (970) 443-8040
Plant Location 3942 125 <sup>th</sup> Ave SW, South Heart, ND, 58655		Source ID No. (AP-100) 3

## EQUIPMENT

Type	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input checked="" type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer
Name of Manufacturer Air-Cure, Inc.			Model Number 376RF10	Date To Be Installed Apr., 09		
Application <input type="checkbox"/> Boiler <input type="checkbox"/> Kln <input checked="" type="checkbox"/> Other (Specify): System #2- Raw Coal (24,100 ACFM)						
Pollutants Removed	Particulate	Coal				
Design Efficiency	Emission rate =	0.005gr/dscf				
Operating Efficiency	Emission rate =	0.005gr/dscf				
Describe Method Used to Determine Operating Efficiency: EPA Method 5 (Front half only)						

GAS CONDITIONS			INLET	OUTLET
Gas Volume (SCFM 68°F., 14.7 psia)			24,100 CFM	24,100 CFM
Gas Temperature (°F.)			Ambient	Ambient
Gas Pressure (in. H <sub>2</sub> O) Approx.			-15" W.C.	Atmospheric
Gas Velocity (ft/sec)			50	50
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration		
	Particulate (Coal)	gr./ACF	5-10 gr./ACF	0.005 gr./dscf
Pressure Drop Through Gas Cleaning Device		1-6" W.C. Maximum		

Signature of Applicant X <i>RR French</i>	Date 01-23-09
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## INSTRUCTIONS

Print or Type.

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Please attach the following:

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918 E Divide, 2nd Floor  
Bismarck, ND 58501-1947

Telephone: (701)328-5188



**GAS CLEANING EQUIPMENT PERMIT APPLICATION**  
North Dakota Department of Health  
Division of Air Quality  
SFN 8532 (12-05) (AP-109)

NOTE: Please read instructions before completing this form.

**APPLICANT**

Name of Firm/Organization GTLE Dakota Plant 1 LLC		Application Date October 27, 2008
Name of Person Submitting Application Robert R. French	Title CEO, GTL Energy Ltd.	Telephone Number (970) 443-8040
Plant Location 3942 125 <sup>th</sup> Ave SW, South Heart, ND, 58655		Source ID No. (AP-100) 4

**EQUIPMENT**

Type	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multidone	<input checked="" type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer
Name of Manufacturer Air-Cure, Inc.		Model Number 376RF12		Date To Be Installed Apr., 09		
Application <input type="checkbox"/> Boiler <input type="checkbox"/> Kiln <input checked="" type="checkbox"/> Other (Specify): System #3 - Dryer exhaust (25,508 ACFM)						
Pollutants Removed	Particulate	Coal				
Design Efficiency	Emission rate =	0.02gr/dscf				
Operating Efficiency	Emission rate =	0.02gr/dscf				
Describe Method Used to Determine Operating Efficiency:  EPA Method 5 (Front half only)						

GAS CONDITIONS			INLET	OUTLET
Gas Volume (SCFM 68°F., 14.7 psia)			25,508 ACFM	25,508 ACFM
Gas Temperature (°F.)			200 degrees F (Approx.)	200 degrees F (Approx.)
Gas Pressure (in. H <sub>2</sub> O) Approx.			-10" W.C.	Atmospheric
Gas Velocity (ft/sec)			50	50
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration		
	Particulate (Coal)	gr./ACF	5-10 gr./ACF	0.02 gr./dscf
Pressure Drop Through Gas Cleaning Device		1-6" W.C. Maximum		

Signature of Applicant X <i>RR French</i>	Date 61-23-09
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## INSTRUCTIONS

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Bismarck, ND 58501-1947

Telephone: (701)328-5188



**GAS CLEANING EQUIPMENT PERMIT APPLICATION**  
North Dakota Department of Health  
Division of Air Quality  
SFN 8532 (12-05) (AP-109)

NOTE: Please read instructions before completing this form.

**APPLICANT**

Name of Firm/Organization GTLE Dakota Plant 1 LLC		Application Date October 27, 2008
Name of Person Submitting Application Robert R. French	Title CEO, GTL Energy Ltd.	Telephone Number (970) 443-8040
Plant Location 3942 125 <sup>th</sup> Ave SW, South Heart, ND, 58655		Source ID No. (AP-100) 5

**EQUIPMENT**

Type	<input type="checkbox"/> Cyclone	<input type="checkbox"/> Multiclone	<input checked="" type="checkbox"/> Baghouse	<input type="checkbox"/> Electrostatic Precipitator	<input type="checkbox"/> Wet Scrubber	<input type="checkbox"/> Spray Dryer
Name of Manufacturer Air-Cure, Inc.		Model Number 232RF10		Date To Be Installed Apr., 09		
Application <input type="checkbox"/> Boiler <input type="checkbox"/> Kiln <input checked="" type="checkbox"/> Other (Specify): System #4-Product Coal (15,100 ACFM)						
Pollutants Removed	Particulate	coal				
Design Efficiency	Emission rate =	0.005gr/dscf				
Operating Efficiency	Emission rate =	0.005gr/dscf				
Describe Method Used to Determine Operating Efficiency: EPA Method 5 (Front half only)						

GAS CONDITIONS			INLET	OUTLET
Gas Volume (SCFM 68°F., 14.7 psia)			15,100 CFM	15,100 CFM
Gas Temperature (°F.)			Ambient	Ambient
Gas Pressure (in. H <sub>2</sub> O) Approx.			-12" W.C.	Atmospheric
Gas Velocity (ft/sec)			50	50
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration		
	Particulate (Coal)	gr./ACF	5-10 gr./ACF	0.005 gr./dscf
Pressure Drop Through Gas Cleaning Device			1-6" W.C. Maximum	

Signature of Applicant X <i>RR French</i>	Date 01-23-09
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## INSTRUCTIONS

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Division of Air Quality  
918 E Divide, 2nd Floor  
Bismarck, ND 58501-1947

Telephone: (701)328-5188



**PERMIT APPLICATION - INTERNAL COMBUSTION ENGINES**  
**NORTH DAKOTA DEPARTMENT OF HEALTH**  
**DIVISION OF AIR QUALITY**  
SFN 8891 (12-05) (AP-113)

**GENERAL**

Name of Firm or Organization <b>GTL Energy, Ltd.</b>		Plant Location <b>3942 125<sup>th</sup> Ave. SW, South Heart, ND 58655</b>	
Facility Name <b>GTLE Dakota Plant 1 LLC</b>		Source Identification Number (From Form AP 100) <b>6</b>	
Person Submitting Report <b>Robert R. French</b>	Title <b>CEO, GTL Energy, Ltd.</b>	Telephone Number (970) 443-8040	Application Date October 27, 2008
TYPE OF UNIT <input checked="" type="checkbox"/> Stationary Gas Turbine for Electricity Generation <input type="checkbox"/> Large Stationary Diesel and Dual Fuel Engines <input type="checkbox"/> Heavy Duty Nat. Gas-Fired Pipeline Compressor Engines and Turbines <input type="checkbox"/> Gasoline and Diesel Industrial Engines			

**MANUFACTURER'S DATA**

Make <b>CAT</b>	Model <b>DM 5441</b>	Maximum Rating BHP @ <b>470</b>	Operating Capacity BHP @ <b>470</b>
<input type="checkbox"/> 4 Stoke <input type="checkbox"/> 2 Stroke	<input type="checkbox"/> Rich Burn <input type="checkbox"/> Lean Burn	<input checked="" type="checkbox"/> Spark Ignition <input type="checkbox"/> Compression Ignition	

**FUELS USED**

Natural Gas	<b>2,236 x 10<sup>3</sup> cu. ft./year</b>	Percent Sulfur	Percent H <sub>2</sub> S
Oil	gal./year	Percent Sulfur	Grade No.
LP Gas	gal./year	Other (Specify)	

**COMPRESSOR STATION & FLARE DATA (if applicable)**

Frequency of Flaring	Quantity Flared	Percent H <sub>2</sub> S
WILL FLARING OF GAS COMPLY WITH APPLICABLE AMBIENT AIR QUALITY STANDARDS?		<input type="checkbox"/> YES
For natural gas pipeline transmission and/or distribution, indicate volume of natural gas compressed.		Cu.ft./hour

**NORMAL OPERATING SCHEDULE**

Hours Per Day	Days Per Week	Weeks Per Year	Hours Per Year <b>500</b>	Peak Production Season (if any) This generator will provide for emergency power generation in the event power from the primary power provider is temporarily curtailed.
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**EMISSIONS TO THE ATMOSPHERE**

EMISSION POINT	STACK HEIGHT (FEET)	STACK DIAMETER (FEET AT TOP)	GAS DISCHARGED (SCFM)	EXIT TEMP (°F)	GAS VELOCITY (FPS)
(ENGINE)	<b>8</b>	<b>0.67'</b>	<b>2476</b>	<b>892</b>	<b>118</b>
(FLARE)					

**EMISSION CONTROL EQUIPMENT**

Is there any emission control equipment on this unit? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Where a gas cleaning device exists, a GAS CLEANING EQUIPMENT Form AP 109 (SFN 8532) must be completed and attached.
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## AIR CONTAMINANTS EMITTED

EMISSION POINT	POLLUTANT	AMOUNT (POUNDS PER HOUR)	AMOUNT (TONS PER YEAR)	BASIS OF ESTIMATE*
	NO <sub>x</sub>	22.05	5.51	See Attachment 1
	CO	1.55	0.39	See Attachment 1
	PM			
	PM <sub>10</sub>			
(ENGINE)	SO <sub>2</sub>			
(FLARE)	SO <sub>2</sub>			
	Formaldehyde			
	Total HAPS**			

\* If performance test results are available for the unit, submit a copy of test with this application.

\*\* Total HAPS includes formaldehyde

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR  
POLLUTION RULES AND REGULATIONS? X YES ☐ NO

If "NO" a Compliance Schedule must be completed and attached.

Signature of Applicant

X

Date

01-23-09

## INSTRUCTIONS

Attach any extra pages you may need to explain answers or questions, or to provide complete listings of Emissions, Contaminants, or other items.

Submit your application and all documents to:

ND Department of Health  
 Division of Air Quality  
 918 E Divide, 2nd Floor  
 Bismarck, ND 58501-1947

(701)328-5188